

**WHAT IS CLAIMED IS:**

1. A method comprising:

storing data objects as nodes in a directed graph; and

storing path information for a first object corresponding to a first node, where the

5 path information provides relational information about a direct path through the directed graph between the first node and a second node, where the second node is separated from the first node along the direct path by at least a third node.

2. The method of claim 1 further comprising:

10 accepting a query regarding the first node;

locating the first object; and

accessing the path information to respond to the query.

3. The method of claim 1 wherein storing data objects comprises:

15 storing each data object in a first column of a data table; and

storing a relation of the first data object to a consecutive data object in a second field of the data table, where the consecutive data object is connected to the first data object in the directed graph by a single edge.

20 4. The method of claim 3 wherein storing path information comprises storing the path information in a third field of the data table.

25 5. The method of claim 1 wherein storing path information comprises storing a data string as the path information, where the data string includes at least the second node and the third node.

6. The method of claim 5 comprising comparing the data string to a query regarding the first node, in order to respond to the query.

7. The method of claim 5 wherein storing the data string comprises:  
determining a first direct path through the directed graph of which the first node is a  
part;  
5 determining a first data string based on the first direct path;  
determining a second direct path through the directed graph of which the first node is  
a part;  
determining a second data string based on the second direct path; and  
concatenating the first data string and the second data string for storing as the path  
10 information.

8. The method of claim 1 wherein storing path information comprises  
transforming the relational information into a coded value.

15 9. The method of claim 1 wherein the directed graph includes a hierarchical,  
multi-leveled data structure.

10. The method of claim 1 wherein storing path information comprises updating  
the path information to reflect changes in the directed graph.

20 11. An apparatus comprising a storage medium having instructions stored thereon,  
the instructions including:  
a first code segment for storing data objects within a table;  
a second code segment for storing a relation of a first data object to a second data  
25 object in the table, where the first data object and the second data object correspond to  
consecutive nodes on a directed graph; and  
a third code segment for storing path information associated with the first data object  
in the table, where the path information describes a path within the directed graph that is  
between the first node, the second node, and a third node.

12. The apparatus of claim 11 further comprising:  
a fourth code segment for accepting a query about the first node and a possible  
relation of the first node to another node within the directed graph; and

5 a fifth code segment for responding to the query based on the path information.

13. The apparatus of claim 12 wherein the fifth code segment includes a sixth  
code segment for detecting the first data object within the table and comparing the path  
information to the query.

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14. The apparatus of claim 11 wherein the first data object, the second data object,  
and the path information are stored in separate columns of a single row of the table.

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15. The apparatus of claim 11 wherein the third code segment stores the path  
information as a data string listing the second node and the third node.

16. The apparatus of claim 11 wherein the third code segment stores the path  
information as a coded value generated from information about the second and third node  
and their locations within the directed graph.

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17. A system comprising:  
means for accessing path information that describes a path through a directed graph  
between a first node and a plurality of other nodes; and  
means for responding to a query involving the first node, based on the path  
information.

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18. The system of claim 17 wherein the means for accessing path information  
comprises means for storing the path information or a reference to the path information in a  
table containing a first data object corresponding to the first node.

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19. The system of claim 17 wherein the means for responding to the query comprises means for directly locating the first data object within the table in response to the query.

5 20. The system of claim 19 wherein the means for responding to the query comprises means for performing a pattern match between the query and a data string listing the path through the directed graph.